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10/020,684	12/14/2001	Rohit Garg	UNIV0122	1347

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EXAMINER

CHEN, PO WEI

ART UNIT	PAPER NUMBER
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2676

DATE MAILED: 12/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/020,684

Applicant(s)

GARG ET AL.

Examiner

Po-Wei (Dennis) Chen

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-20 is/are allowed.
- 6) ☒ Claim(s) 21-36 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other:

DETAILED ACTION

Claims 1-36 are pending in this application. Claims 1, 16 and 28 are independent claims.

The present title of the invention is "Macroblock Padding". This action is non-final.

The Group Art Unit of the Examiner case is now 2676. Please use the proper Art Unit number to help us serve you better.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 21-22, 25 and 27 are rejected under 35 U.S.C. 102(e) as being anticipated by Itokawa (US 6,636,644).

3. Regarding claim 21, Itokawa discloses an image processing comprising:

A method for padding a macroblock of a video object (lines 48-49 of column 13 and Fig. 11);

(a) determining a graphics primitive with a host processor based on shape data representing the video object that are accessible by the host processor (lines 28-32 of column 13 and Fig. 11; the image object extracted based on the shape data corresponds to the graphics primitive. While claim recites host processor, the term is broad enough to include object extraction unit which is used to process shape data);

(b) communicating the graphics primitive to a coprocessor (lines 37-43 of column 13 and Fig. 11; while claim recites coprocessor, the term is broad enough to include the padding block generating unit which processing the padding operation that depend on shape data);

and (c) padding the macroblock with the coprocessor, based on the graphics primitive and on texture data that are accessible by the coprocessor (lines 37-63 of column 13 and Fig. 11; it is noted that the padding by the padding block generating unit (coprocessor) utilize shape data and texture data).

4. Regarding claim 22, Itokawa discloses an image processing comprising:

The shape data indicates: (a) any transparent pixels in the macroblock; and (b) any opaque pixels in the macroblock (lines 9-21 of column 14 and Fig. 12; while claim recites transparent and opaque pixels, it is noted the applicant disclosed they are referred to as pixels lie outside and inside, respectively, the boundary of the video object (lines 7-9 of page 3 and line 17 of page 7). It is noted that Itokawa disclosed the later terms).

5. Regarding claim 25, Itokawa discloses an image processing comprising:

The step of padding the macroblock accelerates Motion Picture Experts Group level 4 (MPEG-4) video decoding (lines 12-27 of column 2 and lines 59-64 of column 7; by improving coding efficiency of padding thus accelerates MPEG-4 processing).

6. Regarding claim 27, statements presented above, with respect to claim 21 are incorporated herein. Also see lines 57-67 of column 16 of Itokawa.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Itokawa (US 6,636,644) as applied to claim 21 above, and further in view of Chen et al. (US 6,625,212; refer to as Chen herein).

9. Regarding claim 23, Itokawa discloses an image processing comprising:

(a) determining a number of one or more transparent pixels to be padded from the shape data and (c) determining coordinates of at least one opaque pixel having texture data that will be used for padding said one or more transparent pixels (lines 9-38 of column 14 and Fig. 12; while claim recites transparent and opaque pixels, it is noted the applicant disclosed they are referred to as pixels lie outside and inside, respectively, the boundary of the video object (lines 7-9 of page 3 and line 17 of page 7). And each pixel of each macroblock is being determined if it is outside of the object and set as padding target or inside of the object and set as texture data which is then used for padding if it qualifies as one);

(d) selecting a primitive that encompasses the one or more transparent pixels that were determined (lines 9-13 and 39-44 of column 14 and Fig. 12; the macroblocks that were set as padding target data (including pixels lie outside of the object, or transparent pixels) correspond to the primitive);

and (e) communicating the primitive, at least one transparent pixel, and at least one opaque pixel to the coprocessor (lines 2-47 of column 14 and Fig. 11 and 12; it is noted that the process of determining the transparent and opaque pixel and primitive (padding target data) are being utilize by the padding block unit which corresponds to coprocessor).

Itokawa does not disclose determining coordinates of at least one transparent pixel included in the one or more transparent pixels. Chen discloses a pixel padding procedure utilizing the method (lines 6-25 of column 3 and Table 1; it is noted that each non-object pixel (transparent) or object pixel (opaque) is being located using coordinates). It would have been obvious to one of ordinary skill in the art at the time of invention to utilize the teaching of Chen to provide a more precise location of the pixel using coordinates in Itokawa. Both Itokawa and Chen are directed to a method of macroblocks padding.

10. Regarding claim 24, Itokawa discloses an image processing comprising:

(a) obtaining texture data corresponding to the at least one opaque pixel (lines 46-62 of column 11 and lines 30-38 of column 14 and Fig. 12 and 23; it is noted that the texture data of opaque pixel (outside of object) is being obtain for padding process);

(b) determining a padding texture value for each of the one or more transparent pixels from the texture data corresponding to the at least one opaque pixel (lines 30-38 of column 14 and Fig. 12; it is noted that the texture data of the valid opaque pixel is being used for padding the target transparent pixel); and

(c) rendering the selected primitive to pad each of said one or more transparent pixels of the macroblock (lines 44-50 of column 11 and Fig. 23).

Itokawa does not disclose coordinates of transparent pixel or opaque pixel. Chen discloses a pixel padding procedure utilizing the method (lines 6-25 of column 3 and Table 1; it is noted that each non-object pixel (transparent) or object pixel (opaque) is being located using coordinates). It would have been obvious to one of ordinary skill in the art at the time of invention to utilize the teaching of Chen to provide a more precise location of the pixel using

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coordinates in Itokawa. Both Itokawa and Chen are directed to a method of macroblocks padding.

11. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Itokawa (US 6,636,644) as applied to claim 21 above, and further in view of Gallery et al. (US 6,034,690; refer to as Gallery).

12. Regarding claim 26, Itokawa does not disclose performing MPEG-2 video decoding. Gallery disclose an image processing utilizing the method (lines 10-14 of abstract and lines 34-38 of column 3). It would have been obvious to one of ordinary skill in the art to utilize the teaching of Gallery to provide the capability of processing MPEG-2 data with higher speed (lines 60-61 of column 1, Gallery). Also, both Itokawa and Gallery are both directed to macroblock processing in MPEG format.

13. Claims 28-29 and 32-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Itokawa (US 6,636,644) and further in view of Chen et al. (US 6,625,212; refer to as Chen herein).

14. Regarding claim 28, Itokawa discloses an image processing comprising:

A system for padding a macroblock of a video object, comprising:

(a) a host processor (element 1202 of Fig. 11; while claim recites host processor, the term is broad enough to include any processing unit that is used in a computer environment such as an object extraction unit);

(b) a host memory in communication with the host processor, said host memory storing: machine instructions that cause the host processor to determining a graphics primitive and at least one argument for the graphics primitive based on the shape data (lines 9-13 of column 14

and lines 57-67 of column 16 and Fig. 11-12; it is noted that a storage medium (memory) is used by the processing units such as Fig. 11 to store code to implement various functions of the system such as Fig. 12);

(c) a coprocessor in communication with the host processor to receive the graphics primitive and the at least one argument (lines 37-58 of column 13 and Fig. 11; while claim recites coprocessor, the term is broad enough to include any processing unit that is used in a computer environment such as a padding block unit which receives the macroblocks for padding (primitive) and chroma data (argument));

and (d) a graphics memory in communication with the coprocessor, said graphics memory storing: machine instructions that cause the coprocessor to pad the macroblock based on the graphics primitive, the at least one argument, and the texture data (lines 9-13 of column 14 and lines 57-67 of column 16 and Fig. 11-12; it is noted that a storage medium (memory) is used by the processing units such as Fig. 11 to store code to implement various functions of the system such as Fig. 12).

Itokawa does not disclose the memory stores shape data and texture data defining a texture for the video object. Chen discloses a pixel padding procedure utilizing the method (lines 18-65 of column 2 and lines 52-55 of column 6 and Fig. 7; it is noted that memory stores the video object which contains shape data and texture data (pixel data)). It would have been obvious to one of ordinary skill in the art at the time of invention to utilize the teaching of Chen to provide a memory which would also store object data for the system to easy and quick access to the data. Both Itokawa and Chen are directed to a method of macroblocks padding.

15. Regarding claim 29, Itokawa discloses an image processing comprising:

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In communication with the host processor and the coprocessor, said carrying the graphics primitive and the at least one argument from the host processor to the coprocessor (lines 28-43 of column 13 and Fig. 11; the macroblock (primitive) to be padding processed is being sent to padding block unit (coprocessor) from object extraction unit (host processor))

Itokawa does not disclose data bus. Chen discloses a pixel padding procedure utilizing the method (lines 51-52 column 6 and Fig. 7). It would have been obvious to one of ordinary skill in the art at the time of invention to utilize the teaching of Chen to provide the function of quickly transferring data between different processing units in a system. Both Itokawa and Chen are directed to a method of macroblocks padding.

16. Regarding claim 32-35, statements presented above, with respect to claim 22-25 are incorporated herein. Also see lines 57-67 of column 16 of Itokawa.

17. Claim 30 rejected under 35 U.S.C. 103(a) as being unpatentable over Itokawa (US 6,636,644) and Chen et al. (US 6,625,212; refer to as Chen herein) as applied to claim 28 above, and further in view of Kenyon et al. (US 6,577,769; refer to as Kenyon herein).

18. Regarding claim 30, the combination of Itokawa and Chen does not disclose the data bus is one of an accelerated graphics port (AGP) bus and a peripheral component interconnect (PCI) bus. Kenyon disclose a method of data compression utilizing the data bus (lines 8-12 of column 10). It would have been obvious to one of ordinary skill in the art to utilize the teaching of Kenyon to provide the type of data bus for quickly transferring data between different processing units in a system.

19. Claim 31 rejected under 35 U.S.C. 103(a) as being unpatentable over Itokawa (US 6,636,644) and Chen et al. (US 6,625,212; refer to as Chen herein) as applied to claim 28 above, and further in view of Butter et al. (US 5,768,537; refer to as Butter herein).

20. Regarding claim 31, Itokawa discloses an image processing comprising:

In communication with the host processor and with the coprocessor, the graphics primitive determined by the host processor until a predefined latency period is surpassed, after which the graphics primitive is communicated to the coprocessor (lines 9-47 of column 14 and Fig. 11-12; it is noted that the all macroblocks of image object are being processed first to determine padding target macroblock by object extraction unit (host processor), then they are processed by padding unit (coprocessor). The predefined latency period correspond to the period of all macroblocks have been processed to determine padding target data). The combination of Itokawa and Chen does not disclose buffer to temporarily store data. Butter disclose a digital video encoder utilizing a buffer (lines 64-66 of column 4). It would have been obvious to one of ordinary skill in the art to utilize the teaching of Butter to provide a buffer to temporarily store data until it is used to provide better control of the processing order of the data.

21. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Itokawa (US 6,636,644) and Chen et al. (US 6,625,212; refer to as Chen herein) as applied to claim 28 above, and further in view of Gallery et al. (US 6,034,690; refer to as Gallery)

22. Regarding claim 36, statements presented above, with respect to claim 26 are incorporated herein. Also see lines 57-67 of column 16 of Itokawa.

Allowable Subject Matter

23. Claim 1-20 allowed.

24. The following is a statement of reasons for the indication of allowable subject matter:

Prior art references do not anticipate or suggest the limitation “determining a horizontal primitive with the host processor, as a function of a number of successive transparent pixels detected in the row” and “for each row that includes only transparent pixels, determining a vertical primitive as a function of a number adjacent rows that include only transparent pixels” in combination with the other claim limitations in claim 1 and 16.

Conclusion

25. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kim (US 5,881,175);

Chen et al. (US 6,208,693);

Suzuoki (US 6,071,193);

Boon (US 6,154,570).

Inquiry

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Po-Wei (Dennis) Chen whose telephone number is (703) 305-8365. The examiner can normally be reached on 9am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew C Bella can be reached on (703) 308-6829. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

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Po-Wei (Dennis) Chen

Examiner

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Po-Wei (Dennis) Chen

December 8, 2003

A handwritten signature in black ink, reading "Matthew C. Bella". The signature is fluid and cursive, with the first name "Matthew" being more prominent and the last name "Bella" following in a similar style.

MATTHEW C. BELLA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600